



# The Antioxidant and Antidepressant Properties of Dietary Proteins Derived from Egg and Bean Extracts and Their Acute Toxicity: A Journey from Nutrition to Pharmacognosy

**Amal El Hamsas El Youbi\*, Omaima Boudaia, Zineb Sekkout, Najat El Amrani and Driss Radallah**

## Article Information

Laboratory of Biology and Health, Department of Biology, Faculty of Sciences Ben M'Sik, University Hassan II, Casablanca, Morocco

**Correspondence:** Amal El Hamsas El Youbi, Department of Biology, Faculty of Sciences Ben M'Sik, University Hassan II, Casablanca, Morocco, Email: [amal.elyoubi@gmail.com](mailto:amal.elyoubi@gmail.com)

**Submitted:** November 06, 2023

**Approved:** November 14, 2023

**Published:** November 16, 2023

**How to cite this article:** El Youbi AE, Boudaia O, Sekkout Z, El Amrani N, Radallah D. The Antioxidant and Antidepressant Properties of Dietary Proteins Derived from Egg and Bean Extracts and Their Acute Toxicity: A Journey from Nutrition to Pharmacognosy. IgMin Res. Nov 16, 2023; 1(1): 032-042. IgMin ID: igmin114; DOI: 10.61927/igmin114; Available at: [www.igminresearch.com/articles/pdf/igmin114.pdf](http://www.igminresearch.com/articles/pdf/igmin114.pdf)

**Copyright license:** © 2023 El Youbi AE, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Keywords:** Pharmacognosy; Antidepressant; Antioxidant; Acute toxicity; Eggs and beans

**Abbreviations:** i.p: Extracts Intraperitoneally; b.w.: Body Weight; DPPH: 2,2-diphenyl-1-picrylhydrazyl



## Abstract

This research reveals the previously unexplored pharmacognostic potential of antidepressants found in nutrients derived from both legume and animal sources. Through preclinical investigations involving mouse models, the study focused into antidepressant and antioxidant activities of non-denatured and denatured protein extracts from beans and eggs. Non-denatured protein extracts from beans and eggs, at saturation levels of 40% and 80%, were examined as macronutrients, while denatured protein extracts at equivalent saturation levels were considered micronutrients. The study employed the DPPH and hydrogen peroxide tests to assess antioxidant activity, and the forced swimming test and sucrose preference test to evaluate acute and chronic mild antidepressant effects, respectively. The acute toxicity study revealed that macronutrients from eggs at 40% and 80% saturation displayed non-toxic effects ( $LD_{50} > 5$  g/kg), while those from beans, specifically at saturation of 80%, exhibited a relatively low level of toxicity ( $LD_{50} = 2.5$  g/kg). Evaluation of antioxidant activity using the DPPH test yielded inconclusive results due to the influence of ethanol precipitation. In contrast, the  $H_2O_2$  test demonstrated significant antioxidant potential in both macronutrients and micronutrients extracted from beans and eggs at all saturation levels. In investigating antidepressant properties, both macronutrients and micronutrients of bean and egg protein extracts at 40% and 80% saturation exhibited notable antidepressant effects, particularly the micronutrients at saturation of 80%. This antidepressant effect was characterized by a reduction in immobility time and an increase in sucrose preference.

In conclusion, this study uncovers the multifaceted potential of protein extracts sourced from natural products, plant and animal origins, as agents for treating depression. It opens up new avenues for research, with implications ranging from neuroprotection to the management of depression, inspiring optimism for innovative approaches to mental health treatment.

## Introduction

In recent years, the intricate connection between diet and mental health has garnered increasing attention within the realm of scientific inquiry. Among the various dietary components, proteins have emerged as crucial players not only in maintaining physical health but also in influencing mental well-being [1-3]. The impact of dietary proteins on the complex landscape of depression has become a subject of considerable



